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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,152	08/01/2003	Rodney S. McKenzic	RAYO 9324(RP-1610A)	5432
49376	7590	07/05/2007	EXAMINER	
SENNIGER POWERS (RAYO) ONE METROPOLITAN SQUARE 16TH FLOOR ST. LOUIS, MO 63102			WANG, EUGENIA	
ART UNIT		PAPER NUMBER		1745
NOTIFICATION DATE		DELIVERY MODE		07/05/2007 ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary	Application No.	Applicant(s)
	10/633,152	MCKENZIE ET AL.
Examiner	Art Unit	
Eugenia Wang	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 24 April 2007.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1,3,4,7-12 and 64-88 is/are pending in the application.
 4a) Of the above claim(s) 77-88 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1,3,4,7-12 and 64-76 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 25 October 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 24, 2007 has been entered.

Response to Amendment

2. In response to the amendment received April 24, 2007:

- a. Claims 5 and 6 have been canceled and claims 64-88 have been added as per Applicant's request. Claims 1, 3, 4, 7-12, and 64-88 are pending.
- b. The previous drawing rejections are withdrawn.

Election/Restrictions

3. Newly submitted claims 77-88 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The inventive concept has resulting screen having a total height which exceeds the cumulative diameter of the longitudinally extending and laterally extending electrically conducting wires. This inventive concept is different from what was presented in the previous claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for

prosecution on the merits. Accordingly, claims 77-88 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

4. The drawings received on April 24, 2004 are accepted.
5. The drawings (filed on 10/25/06, namely figs. 5-6) are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the parallel relationship of the nodules in claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 3, 4, 7-12, 69, and 71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 69 recites grains that are parallel; however, the directionality of the parallel aspect is not readily ascertained. For the prosecution of this application, a claim interpretation will be applied – that the parallel relationship is relative to the wire. (Since claims 3, 4, 7-12, and 64, dependent on claim 1, and claim 71, dependent on 69, fail to clarify the issue, they are rejected as well.)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 10-12, 64, 65, 68, 69, 73-76 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4476002 (Howard et al.).

As to claims 1, 65, 68, and 69, Howard et al. teach a metal current carrier for electrochemical cells for use in metal-air cells (wherein a metal-air cell inherently has a

diffusion layer to deliver air to the cathode) (col. 1, lines 7-14). The current carrier is a thin nickel screen (mesh) with metal particles sintered to the surface of the screen on one side (col. 3 lines 10-15). As seen in example 1, nickel is the example of metal particles sintered onto the surface (col. 8, lines 30-45). After the metal (comprising nickel) is sintered onto the screen, it inherently acts as a bonding mechanism to make the screen one single metallurgical unit (as applied to claim 9)

Furthermore, the coarse metal particles bonded to the nickel wire (col. 4 lines 26-27) produce a conductive and mechanically supportive mesh. The coarse metal particles (columnar grains) provide a rough textured surface and are clumped in such a manner that they form nodules, which are formed due to the relationship of the particle size and the mesh spacing (col. 4, line 60 to col. 5, line 7; fig. 3). As seen in fig. 3, the nodules (formed of the layer [16]) extend outwardly normal to the wires. As the nodules lie parallel to the individual wires, they can be said to be parallel to each other in that respect as well. (This paragraph applies to claims 1, 68, and 69.)

As to claims 10, 11, 73, and 74 Howard et al. teaches that the screen (wires that form a mesh) is nickel (a transition metal) (col. 3, lines 10-15).

As to claims 12, 64, 75, and 76 activated carbon and PTFE (disposed on the outer surface) is used in the active layer of the electrode as the active material and binder (col. 8 lines 11-15 and claim 27).

Response to Arguments

8. Applicant's arguments filed April 24, 2007 have been fully considered but they are not persuasive.

Applicant argues that Howard et al. fail to disclose columnar grains, which are substantially parallel to each other and extend substantially normal to the wires.

Examiner respectfully disagrees. As mentioned above, the use of parallel lacks sufficient definition and has been interpreted with respect to the wire. Furthermore, the particles of Howard et al. are grains, which would stand in a fashion that is normal to the wire it is sintered onto. Any grouping of particles could be defined as a nodule. As set forth within the 103 rejection, one of ordinary skill in the art would be able to define a protrusion as a nodule, and the protrusions in the mesh occur at the times where the wires are interlaced (within the 102 rejection, a broad interpretation of nodule is taken). Therefore, nodules exist in Howard et al.'s teaching. Furthermore, the nodules of the instant application are used for increasing the surface area of the screen. Likewise, the topography of Howard et al. achieves the same increased surface area.

Applicant notes that new claims 65-76 overcome the art in the fact that the Howard et al. does not describe a single metallurgical unit out of wire mesh.

Examiner respectfully disagrees. The particles sprinkled onto the mesh of Howard et al. are sintered, and thus connect the mesh in such the manner that it is a single metallurgical unit. (The process limitations described within the remarks are irrelevant, as the claims of the instant application are drawn to the product. And the product of Howard et al. still applies to the product, as described above.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1745

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 3, 4, 7-9, 66, 67, and 70-72 are rejected under 35 U.S.C. 103(a) as unpatentable over Howard et al.

The teachings of Howard et al. have been previously discussed and are herein incorporated.

As to claims 3, 4, 66, and 67, Howard et al. teach a metal current carrier for use in constructing air cathodes for electrochemical cells. From example I, it is seen that

nickel is sintered onto a nickel screen (col. 8, lines 30-45). Howard et al. does not explicitly teach depositing a metal comprising nickel using electroplating (as applied to claims 3 and 66) or electroless deposition, sputter deposition, or chemical deposition (as applied to claims 4 and 67). However, the claims are product-by-process claims.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

As to claims 7 and 70, Howard et al. does not specifically define the size of the nodules as between 10 to 100 μm in diameter. However, it can be defined in a manner

such that it fits this range. Furthermore, one of ordinary skill in the art would reasonably define the nodules with respect to the wire diameter. Example I (col. 8, lines 30-45) has an example where the wire is about 5 mils thick.

$$5 \text{ mils} * \frac{25.4 \text{ } \mu\text{m}}{1 \text{ mil}} = 127 \text{ } \mu\text{m}$$

It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990))

As to claims 8 and 71, Howard et al. teach that the metal particles that are no greater than one-half the spacing between the wires in the screen, but no less than one-twentieth of the screen size opening (col. 4, line 68 to col. 5, line 5). However, the size between 1 and 30 μm is not specifically claimed. However, one of ordinary skill in the

art would appreciate using meshes with different screen openings and would be able to have particle sizes that fall between the 1 and 30 μm size, dependent on that. Furthermore, the courts have held that where the only difference between the prior art and the claimed invention was a recitation of relative dimension(s) of the claimed device and the device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. See MPEP 2144.04.

As to claims 9 and 72, as previously stated, Howard et al. teaches nickel particles sintered on a metal screen (abs). However, Howard et al. does not specifically define the nodules. One of ordinary skill in the art would appreciate the definition of the nodules at the intersection points of the mesh since more particles would settle around the area, as it has more surface area with the bends. Furthermore, the motivation for defining the nodules at that area and for wanting more particles to be sintered in that area would be to reinforce the connection of the mesh for both electrical conductivity mechanical strength. Therefore the nodules would reasonably fall between 5 to 50% of the surface area that is covered by the particles. If not then, it would have been further obvious to one of ordinary skill in the art to optimize the surface area that the nodules cover in order to provide good electronic and mechanical strength without creating a plate that is too bulky or heavy. Claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result, which is different in kind and not merely in degree from the results of the prior art. (MPEP 2144.08) Discovery of optimum of result effective variable in

known process is ordinarily within the skill of art. (In re Boesch, 205 USPQ 215 (CCPA 1980).) Selection of optimum ranges within the prior art's general condition is obvious. (In re Aller, 105 USPQ 233(CCPA 1955))

Response to Arguments

10. Applicant's arguments filed April 24, 2007 have been fully considered but they are not persuasive.

Applicant argues that there is no motivation for modifying the method of depositing particles taught by Howard et al.

Examiner upholds the position adopted by the office as directed to product-by-process claims. The product is structurally the same as that claimed by applicant, and as such, the process to make the product is seen as obvious. (For the interpretation of how Howard et al.'s product meets that of the instant application, refer to the Response to Arguments section following the 102 rejection.)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugenia Wang whose telephone number is 571-272-4942. The examiner can normally be reached on 8 - 4:30 Mon. - Fri., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EW


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